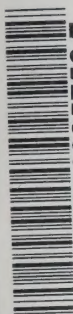


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Government
Publications



Transport
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Transports
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Air Bag Deactivation

What You Need to Know
to
Make an Informed Decision

Canada

For more information on national road safety programs and initiatives, call Transport Canada toll free at **1 800 333-0371** or **(613) 998-8616** if you are calling from the Ottawa area, or e-mail comments or questions to **roadsafetywebmail@tc.gc.ca**. You can also visit the Transport Canada Web site at **www.tc.gc.ca/roadsafety**.

Publications related to child safety:

- Keep Kids Safe — Car Time 1-2-3-4 (Booklet)
- Car Time 1-2-3-4 (Video)
- How to Protect Children in Vehicles with Side Air Bags (Fact Sheet)



You can use this brochure to measure your distance from the air bag since it is 25 cm long. Note that this measurement should not include the thickness of heavy coats or other bulky clothing.

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Introduction

Air bags are proven and effective safety devices. Between 1990 and 2000 inclusive, air bags saved about 300 lives in Canada. The number of lives saved increases each year, as air bags become more common in vehicles on our roads.

However, the number of lives saved is not the whole story. Air bags are particularly effective in preventing life-threatening and debilitating head and chest injuries. A study of real-world crashes conducted by the U.S. National Highway Traffic Safety Administration (NHTSA) found that the combination of seat belts and air bags is 75 % effective in preventing serious head injuries and 66 % effective in preventing serious chest injuries. That means 75 of every 100 people who would have suffered a serious head injury in a crash, and 66 out of 100 people who would have suffered chest injuries, were spared that fate because they wore seat belts and their vehicle had air bags.

For some people, these life saving and injury-preventing benefits come at the cost of a less severe injury caused by the air bag itself. Most air bag injuries are minor cuts, bruises, or abrasions and are far less serious than the skull fractures and brain injuries that air bags prevent. However, eight people have been killed by air bags up until June 1, 2001. These deaths are tragic, but rare events. In Canada in 1999, for instance, there were 153,720 collisions which resulted in 222,275 injuries and 2,969 deaths.

The one fact that is common to all who died as a result of the air bag is NOT their height, weight, sex, or age. Rather, it is the fact that they were too close to the air bag when it started to deploy.

The vast majority of people can avoid being too close to an air bag and can minimize the risk of serious air bag injury by making simple changes in behaviour. Shorter drivers can adjust their driving position. Front-seat adult passengers can sit a safe distance from their air bag. Infants and children age 12 and under should sit in the back seat. And everyone must buckle up. All provinces and territories have legislation that require all occupants of a vehicle to wear seat belts and children to be positioned in appropriate child seats. The limited number of people who cannot make these changes may benefit from having the opportunity to turn off their air bags when necessary.

Consumers can choose to have the air bags in their vehicle deactivated if they are, or a user of their vehicle is, in a risk group. In most cases, air bags will be deactivated through the use of an on-off switch installed by your dealer or other service technician. In some cases, other forms of deactivation will be provided.

The following information provides the facts you need to know about air bags so you can make an informed decision.

Risk Groups—Who should consider deactivating their air bags?

- People who **have no option** but to transport infants riding in rear-facing infant seats in the front passenger seat.
- People who **have no option** but to transport children age 12 and under in the front passenger seat.
- Drivers who **cannot** change their customary driving position and keep 25 cm¹ between the center of the steering wheel, where the driver-side air bag is located, and the center of their sternum (breastbone).
- People whose doctors say that, due to their medical condition, the air bag poses a special risk that **outweighs** the risk of hitting their head, neck or chest in a crash if the air bag is turned off.

Generally, if you **do not** meet at least one of these criteria, nor does any user or occupant of your vehicle, then there is no reason for you to even consider the installation of an on-off switch. Turning off your air bag will not benefit you nor the other users of your vehicle. Instead, it will increase the risk that you and the other users will suffer a head, neck or chest injury by violently striking the steering wheel or dashboard in a moderate to severe crash.

What is an on-off switch?

An on-off switch allows an air bag to be turned on and off. The on-off switch can be installed for the driver, passenger, or both. To limit misuse, a key must be used to operate the on-off switch. When the air bag is turned off, a light comes on. There is a message on or near the light saying “DRIVER AIR BAG OFF” or “PASSENGER AIR BAG OFF.”

The air bag will remain off until the key is used to turn it back on.

What steps can you take to reduce air bag risk without installing an on-off switch?

- *Always place an infant in a rear-facing infant seat in the back seat.*
- *Always transport children 12 years old and under in the back seat and use appropriate and properly installed child restraints.*
- *Always buckle your seat belt. The law requires it all across Canada.*
- *Keep 25 cm between the center of the air bag cover and the center of your sternum.*

¹ Note that here, and everywhere else where the 25-cm distance is mentioned, the thickness of heavy coats and of other bulky clothing should not be included in the measurement.

The vast majority of people don't need an on-off switch. Almost everyone age 13 and over is much safer with air bags than without them. This includes short people, tall people, older people and pregnant women—in fact, all people, male or female, who buckle their seat belts and who can sit far enough back from their air bag. Ideally, you should sit with 25 cm between the center of the air bag cover and the center of your sternum. The nearer you can come to achieving the 25-cm distance, the lower your risk of being injured by the air bag and the greater your chance of being saved by the air bag. If you can get back almost 25 cm, the air bag will still help you in a crash.

Why Some People are at Risk

How do air bag deaths occur?

To perform well, an air bag must deploy quickly. The force is greatest in the first 8 cm after the air bag bursts through its cover and begins to inflate. Those 8 cm are the “risk zone.” The force decreases as the air bag inflates farther.

Occupants who are very close to or on top of the air bag when it begins to inflate can be hit with enough force to suffer serious or fatal injuries. However, occupants who are properly restrained and sit 25 cm away from the air bag cover will contact the air bag only after it has completely or almost completely inflated. The air bag then will absorb the kinetic energy of the occupants and protect them from hitting the hard surfaces in the vehicle.

A description of how air bags work is given in another section, near the end of this brochure.

Do both children and adults face risk?

Yes, both children and adults face the risk of air bag injury or death if they are positioned too close to the air bag or fail to use proper restraints. Both adults and children have died from air bag-related injuries.

Reducing the Risk

What is the safest way to ride in front of an air bag?

First, move the seat rearward and buckle up—every time, every trip. The lap belt needs to fit over your hips, not your abdomen, and the shoulder belt should lie on your chest and over your shoulder. Remove any slack from the belt. In a crash, seat belts stretch and slow down your movement toward the steering wheel or dashboard. These precautions will give the air bag a chance to inflate before you move forward.

How do I best protect children?

If the vehicle has air bags, **never** place a rear-facing infant seat in the front passenger seat if the air bag is active. **Always** secure a rear-facing infant seat in the back seat. In fact, all children age 12 and under should ride in the back seat.

There are instances when children must sit in front because:

- the vehicle has no rear seat,
- there are too many children for all to ride in back, or
- a child has a medical condition that requires monitoring.

When transporting groups of children, instead of placing some of them in the front seat, the use of a second vehicle should be considered as an alternative.

If children must sit in the front seat, they should use the seat belts and/or child restraint appropriate for their weight and size (see the table at the end of this brochure) and sit against the back of the vehicle seat. The vehicle seat should be moved as far back from the air bag as possible. Make sure the child's shoulder belt stays on. If adult seat belts do not fit properly, use a booster seat. Also, children must never ride on the laps of others.

The brochure entitled "Keep Kids Safe: Car time 1-2-3-4" (TP13511E) from Transport Canada contains more detailed information on the subject. To obtain this brochure, please refer to the information on the inside front cover.

What should teenagers and adults do to be safest on the passenger side?

Passengers must always wear seat belts. Seat belts reduce the distance that they can move forward during a crash. Move the seat toward the rear. Even with the passenger seat all the way forward, the distance between a passenger's chest and the dashboard, where the air bag is stored, is usually more than 25 cm. But more distance is safer.

How do I stay safe when I'm driving?

Since the risk zone for air bags is the first 8 cm of inflation, placing yourself 25 cm from your driver air bag provides you with a clear margin of safety. This distance is measured from the center of the steering wheel to the center of your sternum. If you sit less than 25 cm away, you can change your driving position in several ways:

- Move your seat to the rear as far as you can while still reaching the pedals comfortably.
- Slightly recline the seat back. Although vehicle designs vary, many drivers can achieve the 25-cm distance, even with the driver seat all the way forward, simply by reclining the seat back somewhat. If reclining the seat back makes it hard to see the road, raise yourself by using a firm, non-slippery cushion, or raise the seat if your vehicle has that feature.
- If your steering wheel is adjustable, tilt it downward. This points the air bag toward your chest instead of your head and neck.



Belted and 25 cm or more away

Will following these safety tips guarantee that I will be safe in a crash?

There is no guarantee of safety in a crash, with or without an air bag. However, most of the people killed by air bags would not even have been seriously injured if they had followed the safety tips provided in this brochure.

Are air bags the reason that the back seat is safer for children?

No. The back seat has always been safer, even before there were air bags. In a study of children who died in crashes in the front and back seats of vehicles, very few of which had passenger air bags, it was concluded that placing children in the back reduces the risk of death in a crash by 27 %.

The Air Bag On-Off Switch Decision

Vehicle owners and lessees may consider obtaining an on-off switch for one or both of their air bags but it is unsafe to deactivate an air bag unless they are, or another user of their vehicle is, in one of the four risk groups listed below:

Two groups have a high enough risk that they would **definitely** be better off with an on-off switch:

- **Infants in rear-facing infant seats.** A rear-facing infant seat must **never** be placed in the front passenger seat unless the air bag is turned off.

- **Drivers or passengers with unusual medical conditions.** These are people who have been informed by a physician that an air bag poses a special risk to them because of their condition. However, they should not turn off their air bag unless their physician also has informed them that the risk of having the air bag is greater than the risk posed by not having an air bag. Without an air bag, even belted occupants could hit their head, neck or chest in a crash.

In the U.S., a national conference of physicians considered all medical conditions commonly cited as possible justifications for turning off air bags. In general, the physicians **recommend not turning off air bags** for persons with:

- pacemakers
- supplemental oxygen
- eyeglasses
- median sternotomy
- angina
- chronic obstructive pulmonary disease (COPD)
- emphysema
- asthma
- breast reconstruction, mastectomy
- scoliosis (**if** the person can be positioned properly)
- previous back or neck surgery
- previous facial reconstructive surgery or facial injury
- hyperacusis, tinnitus

- advanced age
- osteogenesis imperfecta, osteoporosis & arthritis
(if the person can sit at a safe distance from the air bag)
- previous ophthalmologic surgery
- Down syndrome and atlantoaxial instability
(if the person can reliably sit properly aligned)
- pregnancy

The physicians did recommend **turning off** an air bag if a **safe sitting distance** or **position cannot be maintained** by a **driver** because of:

- scoliosis or
- achondroplasia

or by a **passenger** because of:

- scoliosis or
- Down syndrome and atlantoaxial instability.

The physicians also noted that a passenger air bag might have to be turned off if an infant or child has a medical condition and must ride in front so that he or she can be monitored by the driver.

The Canadian Medical Association (CMA) has been provided with the report of the U.S. National Conference on Medical Indications for Air Bag Disconnection.

Two other risk groups **may be** better off with an air bag on-off switch:

- **Children age 12 and under.** Children in this age group can be transported safely in the front seat **if** they are properly belted, they do not lean forward, **and** their seat is moved all the way back. But children sometimes sit or lean far forward and may slip out of their shoulder belts, putting themselves at risk. The simple act of leaning far forward to change the radio station can momentarily place even a belted child in danger. If a vehicle owner or lessee has no option but to transport a child age 12 or under in the front seat, the owner or lessee should consider the use of an on-off switch for the passenger air bag. Since air bag performance differs from vehicle model to vehicle model, the vehicle owner or lessee should consult the vehicle manufacturer for additional information.

CAUTION: *If you allow children to ride in the front seat while unrestrained or improperly restrained, and especially if you sit with a child on your lap, you are putting them at serious risk, with or without an air bag. Turning off the air bag is not the safe answer. It would eliminate air bag risk but not the likelihood that, in a crash, an unrestrained child would fly through the air and strike the dashboard or windshield, or be crushed by your body.*

- **Drivers who cannot get back 25 cm.** Very few drivers are unable to sit so that their sternum is 25 cm away from their air bag. If, despite your best efforts, you cannot maintain a distance of 25 cm, you may wish to **consult your vehicle manufacturer for information to help you move back.**

You can use this brochure to measure your distance from the air bag since it is 25 cm long. Note that this measurement should not include the thickness of heavy coats or other bulky clothing.

Since the risk zone is the first 8 cm from the air bag cover, sitting back 25 cm provides a clear margin of safety. While getting back a minimum of 25 cm is desirable, if you can get back almost 25 cm, the air bag is unlikely to seriously injure you in a crash and you probably don't need an on-off switch. If you cannot get back 25 cm from the air bag cover, you may wish to consider an on-off switch. Since air bag performance differs among vehicle models, you may wish to consult your vehicle manufacturer for additional information.

What if you are, or another user of your vehicle is, not in one of the listed risk groups?

You are not at risk and do not need an on-off switch. This includes short people, tall people, older people and pregnant women—in fact, all people, male or female age 13 and over, who buckle their seat belts and who can sit with a distance of 25 cm from the center of their sternum to the center of the air bag cover. You will have the full benefit of your air bag and will minimize the risk of violently striking the steering wheel and dashboard in a moderate to severe crash.

Should a pregnant woman get an on-off switch?

No, not unless she is a member of a risk group.

Pregnant women should follow the same advice as other adults: buckle up and stay back from the air bag. The lap belt should be positioned low and over the pelvic bone, with the shoulder belt worn normally. Pull any slack out of the belt. Just as for everyone else, the greatest danger to a pregnant woman comes from slamming her head, neck or chest on the steering wheel in a crash. When crashes occur, the baby can be injured by striking the lower rim of the steering wheel or dashboard or from crash forces concentrated in the area where a seat belt crosses the mother's abdomen. By helping to restrain the upper chest, the seat belt will keep a pregnant woman as far as possible from the steering wheel. The air bag will spread out the crash forces that would otherwise be concentrated by the seat belt.

How do I get an air bag on-off switch?

If you are, or another driver or passenger of your vehicle is, at serious risk, complete the DECLARATION OF REQUIREMENT FOR AIR BAG DEACTIVATION form. On the form, you must indicate which air bag(s) you want equipped with an on-off switch and if the switch is not being installed for you, indicate for whom it is being installed. You must also certify that you have read this information

brochure, certify that you are, or another user of your vehicle is, a member of a risk group listed, and identify the group. If an air bag is deactivated by means other than that of an on-off switch, you must accept either to reactivate the air bag or to inform the subsequent purchaser of the vehicle when it is sold or the owner of the vehicle when it is returned. After you have completed the form, mail it to Transport Canada where it will be verified for completeness and logged. Transport Canada will keep the original form and will send you a stamped copy if it was properly completed. Improperly completed forms will be returned unprocessed. You may take the stamped copy to a dealer or other service technician for the installation of an on-off switch.

It is possible that on-off switches may not be available for a particular make and model of vehicle. In that case, your *manufacturer* or other service technician may provide you with another means of deactivation.

After the work on your vehicle has been carried out, your dealer or other service technician is required to send the declaration form to Transport Canada's Road Safety and Motor Vehicle Regulation Directorate.

It should be noted that dealers or other service technicians are not obligated to install on-off switches or otherwise deactivate air bags and that any work performed on the vehicle will be done at the owner's or lessee's expense. It is also possible that a dealer or other service technician will require that the owner or lessee sign a waiver of liability.

If a vehicle is leased, the lessee should contact the owner before proceeding to have the vehicle's air bag(s) deactivated.

On-Off Switch Precautions

If I turn off an air bag for someone at risk, what precautions should I take for others?

It is important to realize that turning off an air bag is a **temporary measure** intended for the benefit of any **individual** in one of the risk groups described earlier. If such an individual is not seated in front of the deactivated air bag, then it should be turned on or reactivated. For instance:

- An air bag should be deactivated when children age 12 and under are carried in the front seat. As children grow in size beyond this age, the need to maintain the switch in the "off" position disappears.
- Likewise, while a medical condition may justify turning off the air bag in the passenger seat, this would apply only when an individual with this condition is being transported as a front seat passenger.

Since the air bag will not automatically turn itself back "on" after you turn it "off" with an on-off switch, you must remember to turn it "on" when someone who is not at risk is sitting in that seat. Every on-off switch has a light to remind you when the air bag is turned "off".

If I turn "off" an air bag, will the seat belt provide enough protection?

Air bags increase the protection you can get from seat belts alone. If the air bag is turned "off", you lose this extra protection.

In some newer vehicles, turning "off" your air bag may have additional consequences. These vehicles have seat belts that were specially designed to work together with air bags. If the crash forces become too great, these new seat belts "give" or yield to avoid concentrating too much force on your chest. The air bag prevents you from moving too far forward after the seat belts yield. Without the air bag to absorb the energy of the occupant, the risk of hitting the vehicle interior is increased. Ask your vehicle manufacturer for information on whether your seat belts were specially designed to work with air bags.

How Air Bags Work

Air bags are designed to keep your head, neck, and chest from slamming into the dash, steering wheel or windshield in a front-end crash. They are not designed to inflate in rear-end or rollover crashes or in most side crashes. Generally, air bags are designed to deploy when the severity of a crash reaches a preset threshold value. Depending on the specific vehicle model, this threshold is normally equivalent to a vehicle crashing into a solid wall at 13–23 km/h. Air bags most often deploy when a vehicle collides with another vehicle or with a solid object like a tree.

Air bags inflate when a sensor detects a front-end crash severe enough to trigger their deployment. The sensor sends an electric signal to start a chemical reaction that inflates the air bag with harmless nitrogen gas. All this happens faster than the blink of an eye. Air bags have vents, so they deflate immediately after absorbing the energy of an occupant. They cannot smother you and they don't restrict your movement. The "smoke" you may have seen in a vehicle after an air bag demonstration is the nontoxic starch or talc that is used to keep the insides of the air bag from sticking together.

Are all air bags the same?

No. Air bags differ in design and performance. There are differences in the crash speeds that trigger air bag deployment, the speed and force of deployment, the size and shape of air bags, and the manner in which they unfold and inflate. Air bags systems are very complex, computer-controlled devices which, if improperly deactivated, could deprive the vehicle occupants of the benefit of other vital safety systems. That is why you should contact your vehicle manufacturer if you want more information about the air bags in your particular car or truck.

Future Air Bags

Do I need an on-off switch if I buy or rent a vehicle with depowered air bags?

Most manufacturers have been installing depowered air bags starting on their model year 1998 vehicles. They are called "depowered" because they deploy with less force than current air bags. They will reduce the risk of air bag-related injuries. However, even with depowered air bags, rear-facing child seats still should **never be placed** in the front seat and children age 12 and under are **still safest in the back seat**. Contact your vehicle manufacturer for further information.

Will on-off switches be necessary in the future?

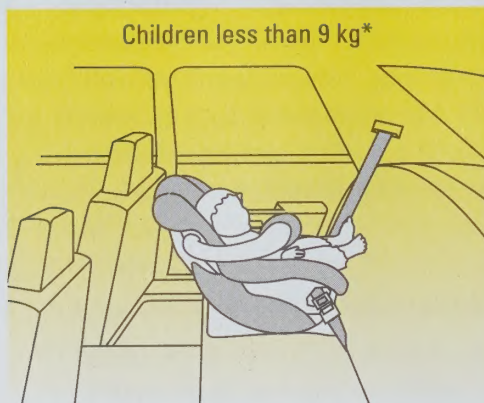
Manufacturers are actively developing so-called "smart" or "advanced" air bags that may be able to tailor deployment based on crash severity, occupant size and position, or seat belt use. These bags should eliminate the risks produced by current air bag designs. It is likely that vehicle manufacturers will introduce some form of advanced air bags over the next few years.

What Restraint is Right for Your Child?

(See inside front cover for references to other Transport Canada child safety publications)

Always in the back seat

Weight and height of your child

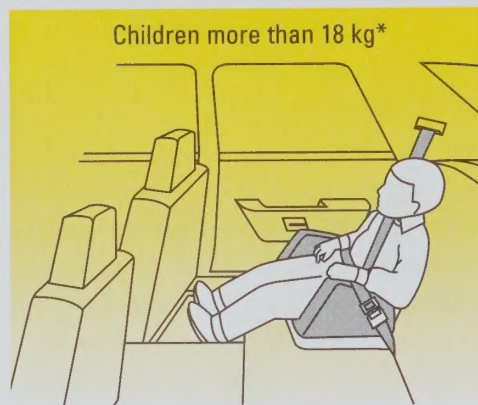


Children less than 9 kg*

Proper type of restraint

Rear-facing infant seat
(secured to the vehicle
by the seat belt)

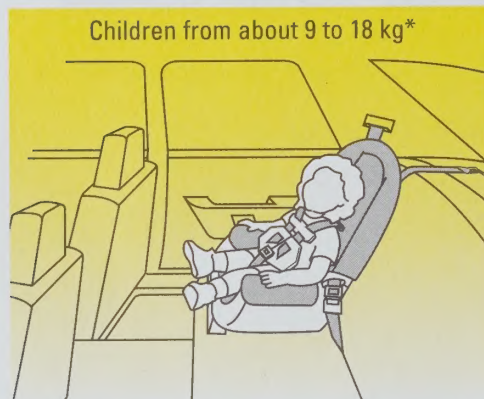
Weight and height of your child



Children more than 18 kg*

Proper type of restraint

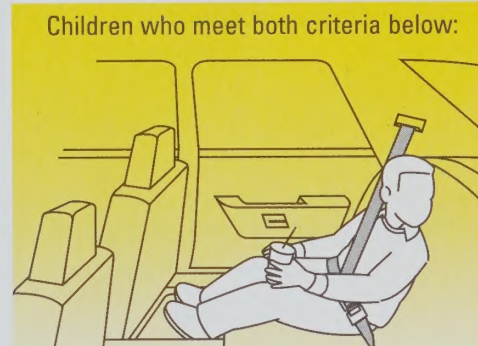
Booster seat, plus both portions of a lap/shoulder belt
(except only the lap portion
is used with some booster
seats equipped with front
shield)



Children from about 9 to 18 kg*

Forward-facing child seat

(secured to the vehicle by
the seat belt and tether
strap)



Children who meet both criteria below:

Both portions of a lap and
shoulder belt

- (1) Their sitting height is 63 cm or more, and
- (2) their legs are long enough to bend over the front of the seat when their backs are against the vehicle seat back.

*To determine whether a particular seat is appropriate for your child, see the seat manufacturer's recommendations concerning the weight and height of children who may safely use the seat.

